**What is claimed is:**

1. A seal for sealing an outer surface of a magnetically permeable shaft to an inner surface of a hub disposed about the shaft, the seal comprising:

(a) an annular magnet positioned between the shaft and the hub;

(b) a top pole piece and a bottom pole piece coupled to opposite poles of the magnet, the top and bottom pole pieces comprising a material which is magnetically permeable, and having annular shapes with interior radii that are larger than the radius of the outer surface of the shaft, the top pole piece comprising a cross-sectional area that is substantially L-shaped, having a long horizontal portion substantially parallel to a surface of a pole of the magnet, and a shorter vertical portion in a facing, non-contact relationship to the outer surface of the shaft; and

(c) a ferrofluid magnetically held between the vertical portion of the top pole piece and the outer surface of the shaft to form a seal therebetween.

2. A seal according to claim 1 wherein the top pole piece is separated from the outer surface of the shaft by a gap which is smaller than a distance separating the top pole piece from the bottom pole piece.

3. A seal according to claim 2 wherein the shaft further comprises and an inner race of a bearing separating the shaft from the hub, and wherein the gap is smaller than a distance separating the top pole piece from the inner race of the bearing.

4. A seal according to claim 1 wherein the top pole piece comprises a curved corner where the vertical portion joins the horizontal portion to spread a magnetic flux gradient over a larger area thereby enabling the ferrofluid to be held over a larger area.

5. A seal according to claim 1 wherein a Nickel cladding is applied to the top pole piece to provide a substantially smooth surface in contact with the ferrofluid.

6. A seal according to claim 1 wherein the shaft comprises a contoured portion, and wherein the seal is positioned between the shaft and the hub so that the vertical portion of the top pole piece is in a facing relationship to the contoured portion.

7. A spindle motor comprising the seal of claim 1, the spindle motor further comprising:

(a) a base to which the shaft is coupled;

(b) a bearing capable of rotatably supporting the hub about the shaft, the bearing having inner and outer races affixed to the shaft and hub respectively;

(c) magnets attached to the hub; and

(d) a stator winding on the baseplate capable of interacting with the magnets on the hub to cause it to turn relative to the shaft.

8. A seal for sealing an outer surface of a shaft to an inner surface of a magnetically permeable hub disposed about the shaft, the seal comprising:

(a) an annular magnet with a pair of annular pole pieces coupled to opposite poles thereof positioned between the shaft and the hub, the pole pieces comprising a magnetically permeable material and having exterior radii that are smaller than a radius of the inner surface of the hub;

(b) a catcher affixed to the inner surface of the hub, the catcher made of a magnetically permeable material and comprising an annular ring having a curved surface on the interior radius thereof, the curved surface in a facing relationship to the exterior radii of the pole pieces;

(c) ferrofluid magnetically held in a gap separating the pole pieces from the catcher affixed to the inner surface of the hub,

whereby when the hub rotated relative to the shaft splashing or outward migration of the ferrofluid it is substantially reduced.

9. A seal according to claim 8 wherein the curved surface comprises a cross-sectional area having a U-shape, and wherein open ends of the U-shape extend radially inward past the exterior radii of the pole pieces.

10. A seal according to claim 8 wherein the pole pieces, ferrofluid, catcher and hub comprise electrically conductive materials, and wherein the pole pieces are electrically coupled to the shaft, the ferrofluid is electrically coupled to the pole pieces and to the catcher, and the catcher is electrically coupled to the hub, and wherein the outer radii of the pole pieces and the inner radius of the hub are selected so that a surface area of ferrofluid electrically coupling the pole pieces to the catcher provide a resistance of less than about $1x10^9$ ohms.

11. A seal for sealing an outer surface of a stationary shaft to an inner surface of a hub supported for rotation about the shaft by at least one bearing having an inner race and an outer race affixed to the shaft and hub respectively, the seal comprising:

(a) an annular magnet with a pair of annular pole pieces coupled to opposite poles thereof positioned between the shaft and the hub;

(b) a magnetic shield arm extending from said outer race over but not connected to the inner race to a position between the shaft and the magnet and pole pieces; and

(c) a ferrofluid magnetically held between the pole pieces and the magnetic shield arm to form a seal between the shaft and the hub.

12. A seal according to claim 11 wherein the magnet has an interior radius that is larger than a radius of the outer surface of the shaft, and the pole pieces having interior radii that are larger than the radius of the outer surface of the shaft but smaller than the interior radius of the magnet, and wherein the magnetic shield arm extends between the inner radii of the pole pieces and the shaft.

13. A seal according to claim 11 wherein the magnetic shield arm comprises a cross-sectional area that is substantially L-shaped, having a radial segment fastened to the outer race at of sufficient length to extend over and interior to the inner race and a axial segment extending substantially parallel to the shaft and between the shaft and the poles of the magnetic seal.

14. A seal according to claim 13 further including a support arm extending axially from the stationary shaft towards the hub, a distal region of the support arm from the shaft supporting a radially outer end of the annular magnet and annular pole pieces, the annular magnet and annular pole pieces extending radially inward towards the shaft from the support arm.

15. A seal according to claim 11 wherein a Nyebar® coating is applied to the magnetic shield arm to reduce radial migration of the ferrofluid away from the seal.

16. A seal according to claim 11 wherein a Nickel cladding is applied to the magnetic shield arm to provide a substantially smooth surface in contact with the ferrofluid.

17. A seal according to claim 11 wherein the top pole piece comprises a cross-sectional area that is substantially L-shaped, having a long horizontal portion substantially parallel to a surface of a pole of the

magnet, and a shorter vertical portion in a facing relationship with and substantially parallel to a shield portion of the magnetic shield arm.

18. A seal according to claim 17 wherein the vertical portion of the top pole piece comprises a contoured surface facing the shield portion of the magnetic shield arm to introduce a magnetic flux gradient between the top pole piece and the shield portion that axially concentrates the ferrofluid between a center of the contoured surface of the vertical portion and the shield portion of the magnetic shield arm.

19. A seal according to claim 11 wherein the support arm comprises a non-magnetic material.

20. A seal according to claim 11 wherein the magnetic shield arm comprises a magnetic stainless steel material.